WILDLIFE ECOLOGY TEAM
WILDLIFE HABITAT RELATIONSHIPS
IN WASHINGTON AND OREGON
FY2013

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Title:

Demographic characteristics of spotted owls in the Oregon Coast Ranges, 1990–2013.

Principal Investigator and Organizations:

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Study Objective:

The study objective was to elucidate the population ecology of the spotted owl in the Oregon Coast Ranges, to include age and sex specific birth and death rates, and population trend estimates.

Potential Benefit or Utility of the Study:

Information on the demography of spotted owl populations is used to estimate population trends and assess the effects of different management strategies on spotted owls. This study provides data that estimate survival, reproduction, and population parameters of spotted owls relative to landscape features in the Oregon Coast Ranges.

Research Accomplishments:

Study Area and Methods

The study area was located in the Oregon Coast Ranges, principally on public forest lands administered by the Siuslaw National Forest and the Salem and Eugene Districts of the Bureau of Land Management (Fig. 1). Municipal, state, and private timberlands were interspersed within these federal lands. Within the study area we visited 172

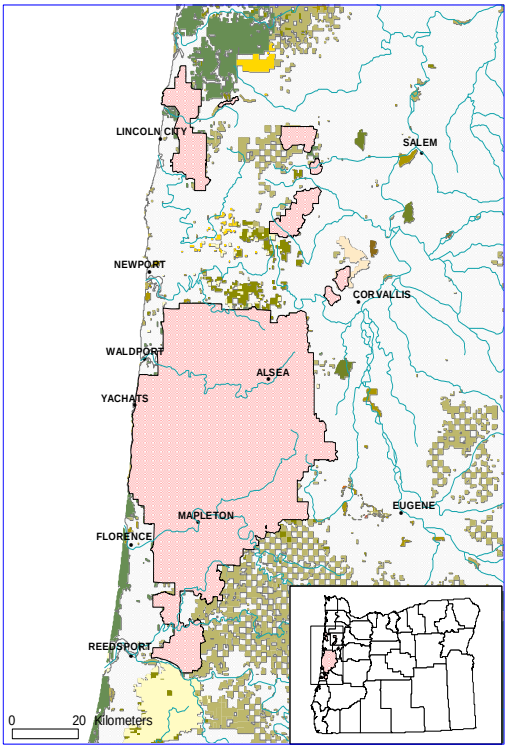

Figure 1. Oregon Coast Ranges spotted owl study area.

continuously-monitored spotted owl sites in 2013 to determine residency, nesting status, and reproductive success of all spotted owls detected. We and cooperating surveyors monitored 2 additional sites where spotted owls were initially detected while surveying adjacent demography sites or that were known from previous year's efforts.

Number of Sites Where Spotted Owls Were Detected

The effort to locate, band, and monitor owls consisted of a combination of surveys conducted by us and cooperators from the Bureau of Land Management, private consulting firms, and timber companies. In 2013, we detected owls at 55 of the 172 sites surveyed (Fig. 2). Owls were detected at 57 sites in 2012 (Fig. 2). We detected 93 non-juvenile spotted owls on the study area. Three of these owls were "extra" individuals detected at sites where another owl of the same sex had already been identified. Additional same-sex owl observations have been a feature of all previous seasons except 1996 and 2011 (Appendix A). For the third consecutive year, no subadult owls were observed on the study area (Appendix C). In 2013, the number of sites with resident pairs was 34, which was an increase from the count of 29 pairs in 2012 (Fig. 2, Appendix A). We detected single owls at 20 sites. Male and female spotted owls were detected at 1 site where pair status was not determined to protocol.

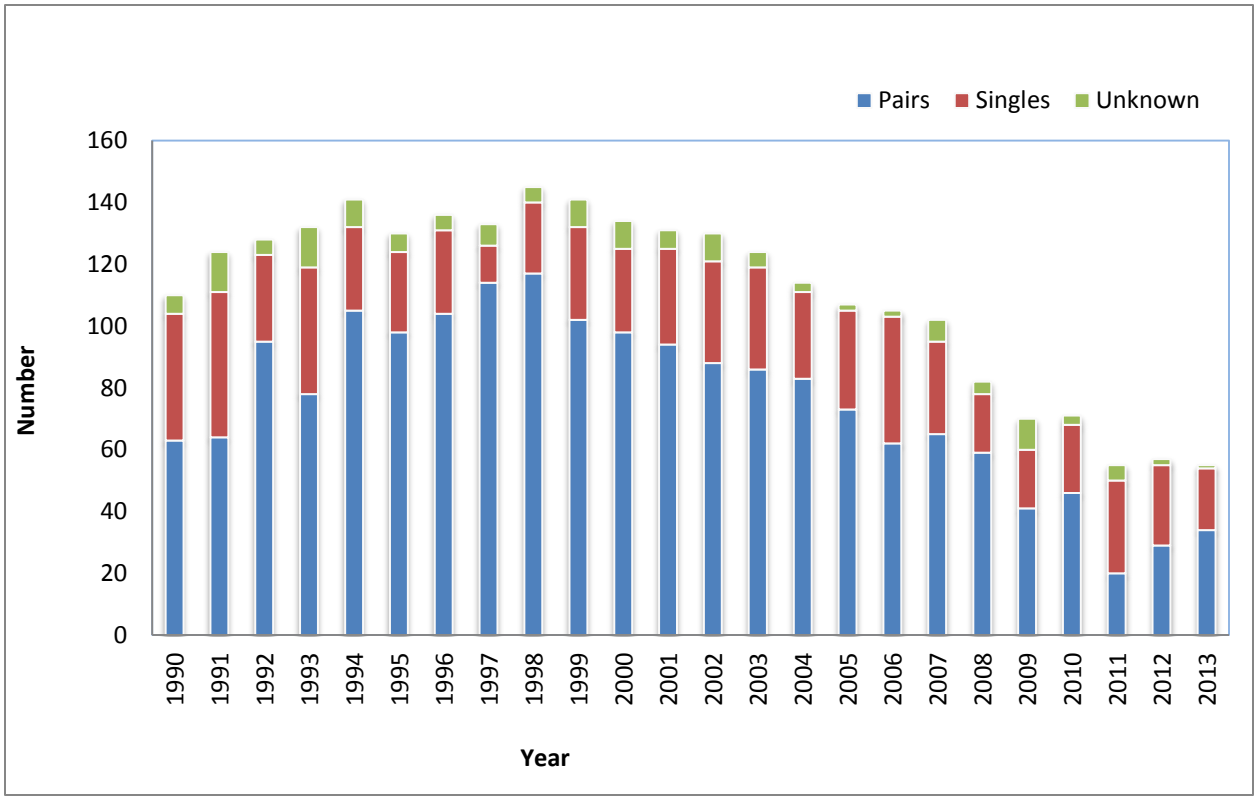

Figure 2. Number of sites where spotted owl pairs, singles, or males and females of unknown status were detected on the Oregon Coast Ranges Study Area, 1990–2013.

Proportion of Sites Where Spotted Owls Were Detected

The percent of sites in which a spotted owl was detected has gradually declined over the course of the study from a high of 88 percent in 1991 to a low of 32 percent in 2011 and 2013. This was with a slight decrease in 2013 from 33 percent in 2012 (Fig. 3, Appendix A). In 2013, pairs were observed at 20 percent of the sites, up from 17 percent in 2012. Single owls were observed at 12 percent of the sites surveyed. In 2013, there was 1 site (<1% of total) where both a male and female were detected, but pair status was not established (Fig. 3, Appendix A).

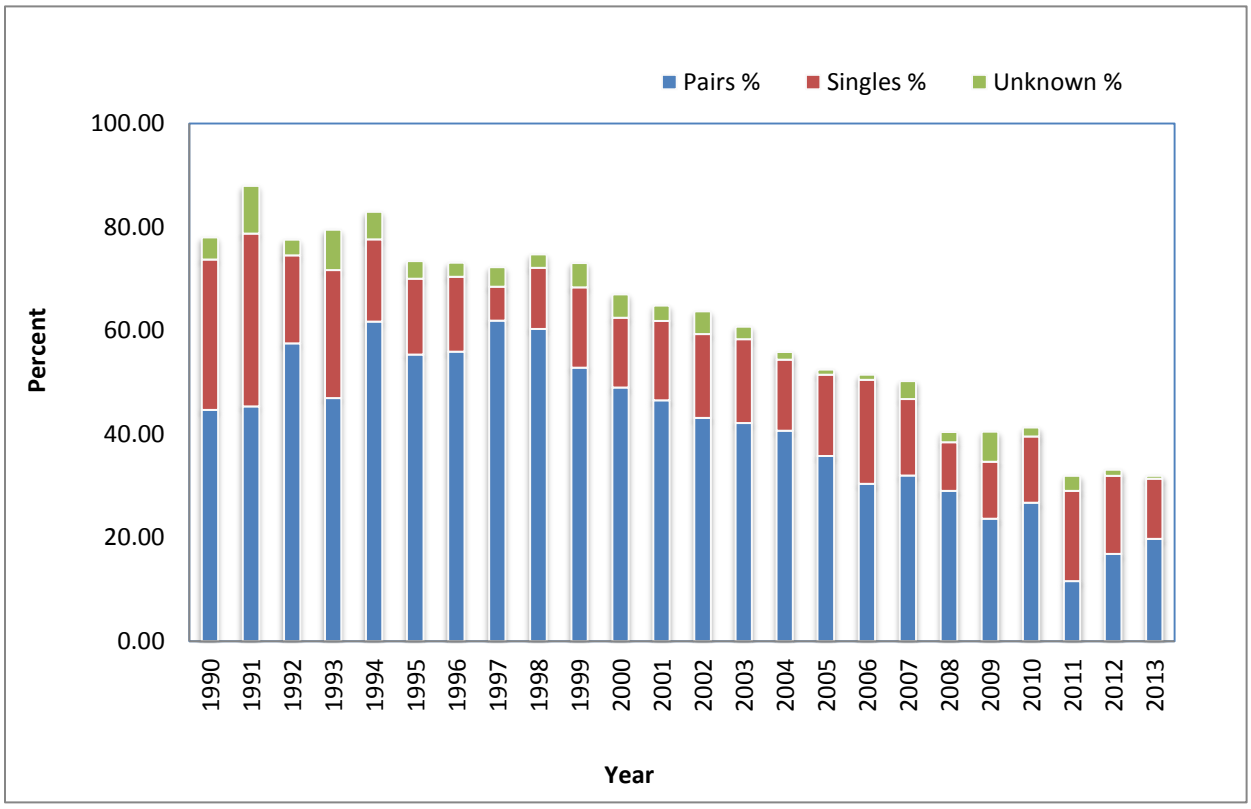

Figure 3. Percent of sites where spotted owl pairs, singles, or males and females of unknown status were detected on the Oregon Coast Ranges Study Area, 1990–2013.

Number of Owls Marked

We banded 334 adult, 77 subadult, and 750 juvenile spotted owls on the study area from 1990-2013 (Appendix B). In 2013, we banded 4 spotted owls on the study area, including 1 adult male, and 2 adult females, and 1 juvenile. One adult male and 3 adult females were recaptured on the study area. Of these, 1 constituted an initial recapture observation of an individual originally banded as a juvenile in a previous year, the other three owls recaptured were individuals whose identity was in question. We also recaptured two adult male spotted owls on sites adjacent to our demographic study area. We banded 2 hybrid young at a site adjacent to the demography study area. One female, and three male barred owls were banded on the study area in 2013.

Emigration and Immigration

We observed 18 owls that dispersed to sites within the study area in 2013. One of these cases was an initial recapture of an owl originally banded as a juvenile in a previous year (natal dispersal). The natal site was in an area adjacent to our demographic study area, thus was a case of immigration. The remaining 17 cases were of owls previously observed elsewhere as non-juveniles (breeding dispersal). Of these, two were immigrations from areas adjacent to the demography study area. The remaining 15 breeding dispersals were between site movements within the study area. Including the natal dispersal, 3 cases of immigration were observed in 2013.

We and cooperators documented an additional 5 dispersals at sites adjacent to the demography study area. Three of these were natal dispersals of owls banded as juveniles in previous years. Of these, two were emigrants from the demography study area, and one had been originally banded off the study area. The other two cases were breeding dispersals of owls most recently observed on the demographic study area, and constituted additional cases of emigration. A total of 4 cases of emigration were observed in 2013.

Barred Owl Detections

The proportion of sites where at least one barred owl was detected within 1.6 km of the year-specific spotted owl activity center has increased steadily throughout the duration of the study, suggesting a steady increase in the barred owl population (Fig. 4, Appendix A). Our survey methods probably underestimated the number of sites with

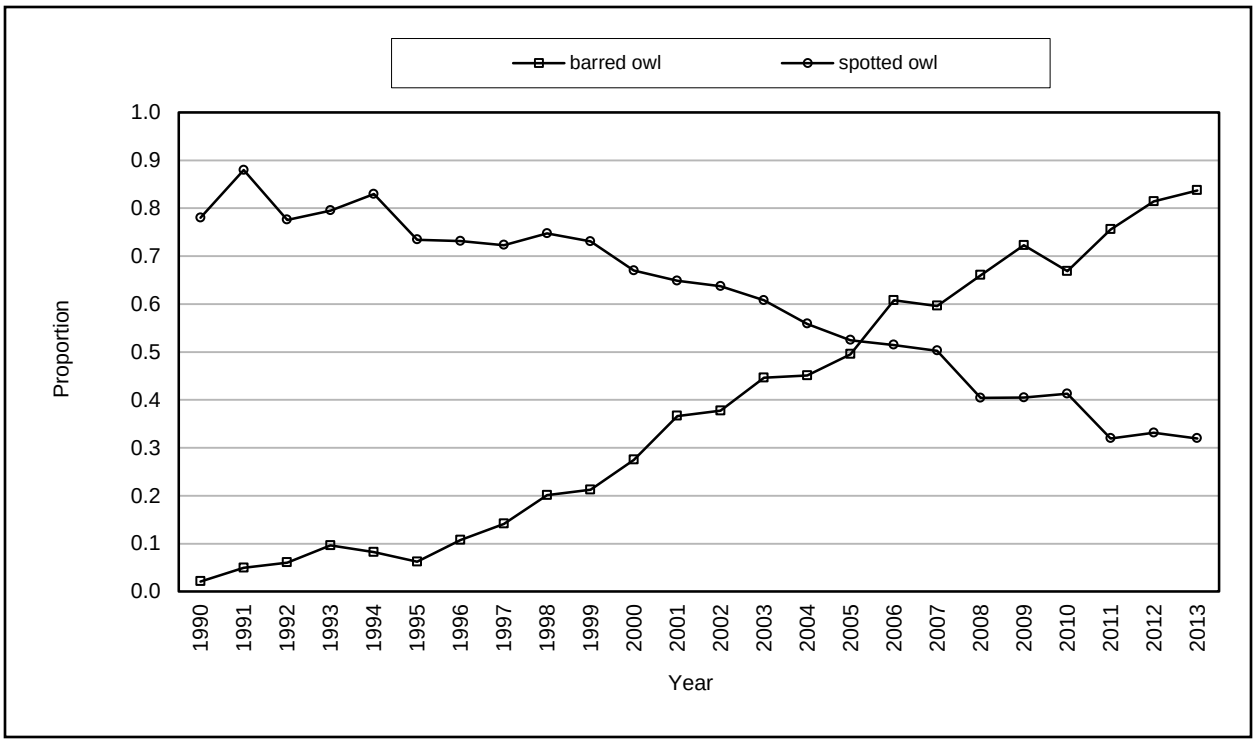

Figure 4. Proportion of spotted owl sites in which barred owls and spotted owls were detected on the Oregon Coast Ranges Study Area, 1990–2013.

barred owls because we did not specifically target barred owls during our surveys of spotted owls. The continued increase in the proportion of territories where barred owls were detected is likely due to an increase in barred owl numbers, as well as increased nighttime survey effort at sites where spotted owls have disappeared (Fig. 5). The proportion of total survey time that included surveys at night had more than doubled from 0.38 in 1990 to 0.78 in 2013 (Fig. 5).

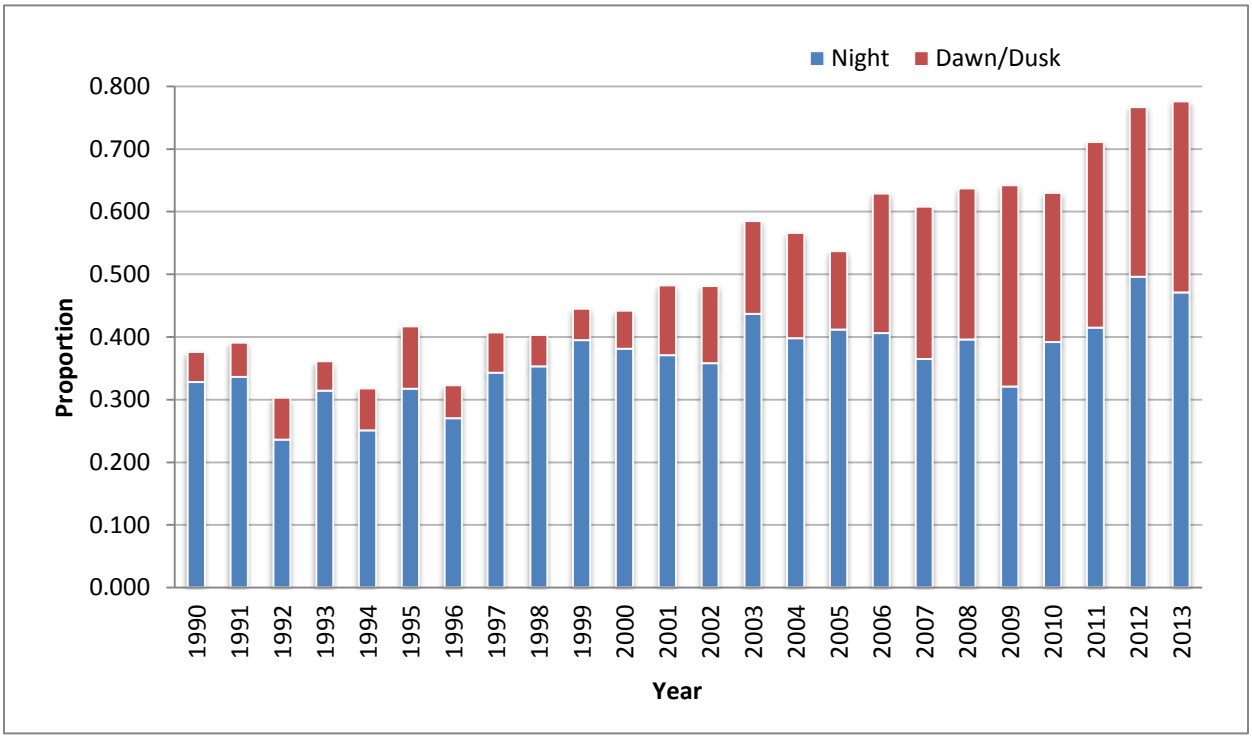

Figure 5. Proportion of survey effort conducted at night and dawn or dusk on the Oregon Coast Ranges Study Area, 1990–2013.

Sex Ratio

Over the course of the study, we have consistently observed a slightly greater proportion of males to females in the territorial population. In 2013 we detected 47 males, 44 females, with a 0.03 proportional difference (Appendix C). The mean difference in the annual proportions of known sex owls detected on the study area in 1990–2013 was 0.08 (SE= 0.01; annual range = 0.01–0.18). We suspect that the disproportionate number of males detected is due to sexual differences in detectability rather than a real difference in the population, but this has not been tested.

Reproduction

We documented the nesting status of 31 females in 2013. Three of these females made nest attempts (Appendix D). Only one of the females who were known to have nested fledged young (Appendix F). One fledgling was produced by the sample of successfully nesting females, resulting in mean brood size estimate of 1 (Appendix H). Of the 39

females that were checked for reproduction by 31 August, only the 1 female known to have made a successful nest attempt had fledged young. The resulting estimate of annual fecundity (number of female young produced per female owl) was 0.01 (SE= 0.01; Fig. 6, Appendix G). The overall mean fecundity estimate from 1990 to 2013 was 0.23 (SE= 0.01; Fig. 6, Appendix G).

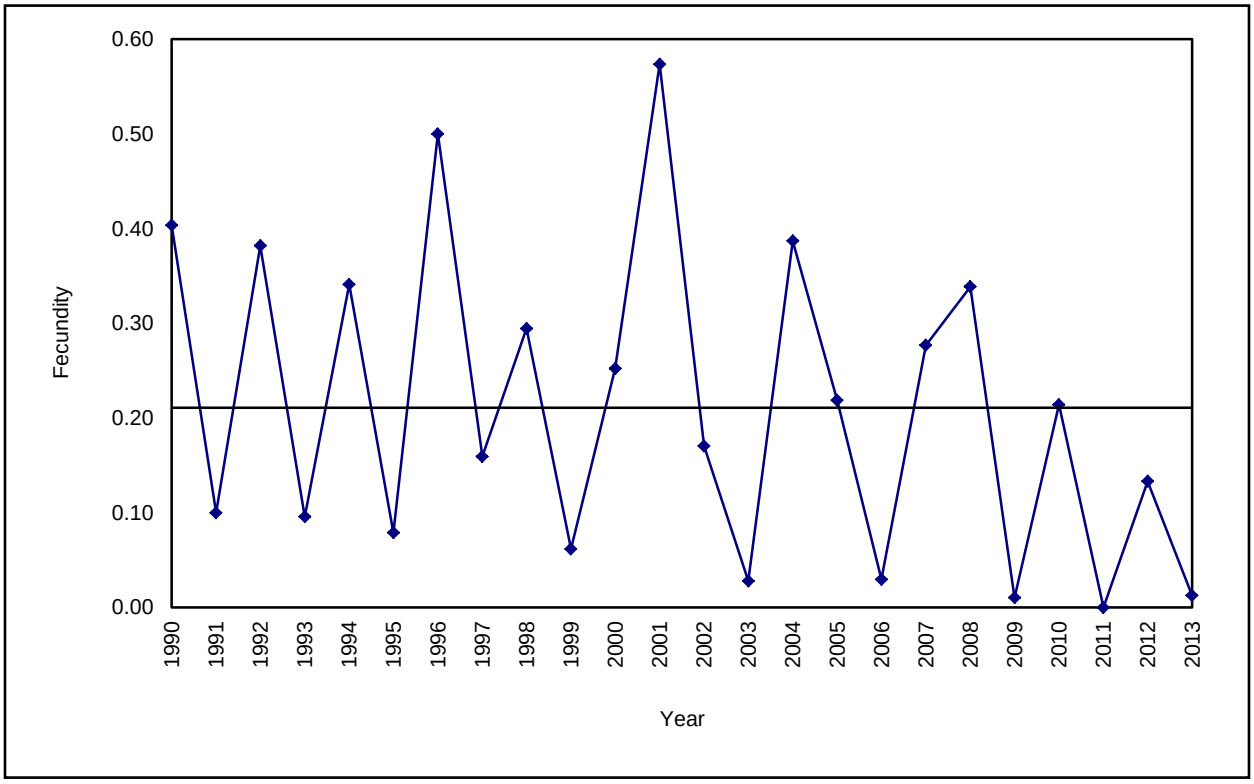

Figure 6. Estimated annual fecundity of female spotted owls on the Oregon Coast Ranges Study Area, 1990-2013. Horizontal line indicates the mean of yearly means (0.21 ± 0.03 SE).

During the first decade of this study, nesting and reproductive estimates followed a cyclic biennial pattern with higher reproduction in even-numbered years. This pattern was not apparent during the latter decade of the study, during which high, low, and intermediate annual reproductive estimates occurred in both odd and even years (Fig. 6, Appendices D–H).

Problems Encountered:

Road closures and a reduction in forest road maintenance have greatly restricted access and resulted in considerable increase in the number of areas that need to be accessed on foot. Diminished access has led to increased survey times. This situation is not likely to change in the foreseeable future.

Research Plans for FY 13:

a. Continue demographic study with field work beginning in March 2014.

Publications and Technology Transfer Activities:

a. Conducted field trips with university students and professional organizations.

b. Provided demographic data to federal, state, and private organizations for their management activities.

c. Provided detailed summary information regarding survey results and territory status determinations to the Siuslaw National Forest and the Eugene, Coos Bay, and Salem Districts of the Bureau of Land Management.

d. Provided updates regarding the current occupancy and reproductive status of owl territories to Oregon Department of Forestry.

e. Participated in meta-analysis workshop January 2014.

Duration of Study:

a. Initiated in FY1990.

b. Contingent upon future funding. Currently funded through FY 2014.

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Lint, J., B. Noon, R. Anthony, E. Forsman, M. Raphael, M. Collopy, and E. Starkey. 1990. Northern spotted owl effectiveness monitoring plan for the Northwest Forest Plan. General Technical Report PNW-GTR-440. USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

Appendix A. Historic spotted owl sites surveyed per year and the number of these with spotted owl pairs, spotted owl singles, unknown status spotted owls, hybrid owls, mixed species pairs, and barred owls in the Oregon Coast Ranges Study Area, 1990–2013. Additional same-sex individuals at a territory were excluded from the counts of pairs, singles, and unknown status owls.

Year	Sites Surveyed	Pairs[1]	Singles[2]	Unknown status[3]	Additional owls[4]	Additional owl sites	Hybrid owls[5]	Mixed spp. pairs[6]	Barred owls[7]
1990	141	63	41	6	6	6	0	0	3
1991	141	64	47	13	9	8	0	0	7
1992	165	95	28	5	8	7	0	0	10
1993	166	78	41	13	2	2	0	0	16
1994	170	105	27	9	5	5	0	1	14
1995	177	98	26	6	2	2	0	0	11
1996	186	104	27	5	0	0	0	2	20
1997	184	114	12	7	4	3	0	1	26
1998	194	117	23	5	5	5	1	1	39
1999	193	102	30	9	5	5	1	1	41
2000	200	98	27	9	7	7	1	1	55
2001	202	94	31	6	3	3	0	0	74
2002	204	88	33	9	5	5	0	0	77
2003	204	86	33	5	8	7	1	0	91
2004	204	83	28	3	10	8	2	2	92
2005	204	73	32	2	3	3	1	1	101
2006	204	62	41	2	2	2	3	2	124
2007	203	65	30	7	7	6	0	0	121
2008	203	59	19	4	1	1	1	1	134
2009	173	41	19	10	3	3	2	2	125
2010	172	46	22	3	2	2	1	1	115
2011	172	20	30	5	0	0	1	0	130
2012	172	29	26	2	2	2	1	0	140
2013	172	34	20	1	3	3	0	0	144

[1]Sites in which a spotted owl pair was present. Spotted owls paired with barred owls or hybrid owls were categorized as singles (9 cases over all years).

[2]Sites in which a single spotted owl was present. If more than a single spotted owl was detected but the birds were of the same sex, it was classified as a single territory.

[3]Unknown status sites had detections of both a male and a female spotted owl, but the birds did not meet pair status.

[4]Additional owls were cases in which more than a single spotted owl of the same sex was detected.

[5]Hybrid owls were considered present if they were detected within the site boundary. Cases include: single hybrid owls (3), hybrid males at a territory occupied by a spotted owl (2), spotted owls paired with hybrid owls (4), hybrid owls paired with barred owls (5); a hybrid male paired with a barred owl at a territory occupied by a spotted owl (2).

[6]Mixed species pairs included territories in which at least one of the birds had some spotted owl ancestry and it was not a straight-forward spotted owl pair (e.g., spotted owl–hybrid owl, hybrid–barred owl, spotted owl–barred owl, etc.), but pair status was established to protocol (16 cases over all years).

[7]Barred owls were considered present if one was detected within 1.6 km of the most recent preceding spotted owl annual activity center.

Appendix B. Number of spotted owls banded on the Oregon Coast Ranges Study Area, 1990–2013.

	Adults		Subadults		
Year	Males	Females	Males	Females	Juveniles
1990	43	31	8	3	32
1991	25	23	2	4	7
1992	28	30	4	4	61
1993	6	8	2	0	13
1994	15	18	3	1	62
1995	5	8	1	2	13
1996	7	1	4	4	100
1997	3	7	4	0	36
1998	2	2	5	1	57
1999	3	5	1	1	10
2000	4	9	1	0	51
2001	1	1	0	3	99
2002	4	1	2	3	28
2003	2	1	1	2	5
2004	4	1	0	2	59
2005	3	2	1	0	24
2006	1	4	1	2	2
2007	3	3	0	0	31
2008	3	2	0	0	36
2009	2	1	3	0	1
2010	1	0	1	1	15
2011	2	1	0	0	0
2012	4	1	0	0	7
2013	1	2	0	0	1
Total:	172	162	44	33	750

Appendix C. Number of spotted owls detected on historic sites in the Oregon Coast Ranges Study Area, 1990–2013.

	Adults		Subadults		Age unk			
Year	Males	Females	Males	Females	Males	Females	Sex Unk	Juveniles
1990	55	41	10	4	35	28	12	40
1991	78	57	7	4	38	25	1	10
1992	92	87	6	7	19	18	7	69
1993	85	79	5	0	35	19	2	14
1994	99	101	14	8	23	13	2	71
1995	110	97	3	3	16	7	0	15
1996	109	94	9	11	12	10	1	107
1997	116	111	9	6	6	9	1	37
1998	116	107	16	10	13	10	0	68
1999	116	105	3	5	15	8	5	13
2000	118	102	5	4	11	6	2	51
2001	107	88	3	4	17	12	3	109
2002	94	78	7	10	26	14	3	31
2003	96	82	7	7	22	5	4	5
2004	91	84	1	4	16	11	3	65
2005	74	76	6	5	11	9	4	32
2006	70	64	2	3	17	10	5	2
2007	71	63	1	2	17	18	9	33
2008	62	53	1	2	15	12	1	38
2009	45	46	3	1	12	12	5	1
2010	47	45	4	1	13	8	4	19
2011	25	24	0	0	15	12	4	0
2012	36	32	0	0	14	4	4	8
2013	41	38	0	0	6	6	2	1

Appendix D. Proportion of female spotted owls that nested on the Oregon Coast Ranges Study, 1990–2013. Estimates were calculated for paired or single females whose nesting status was determined by 1 June.

	n			Nesting Adults		Nesting Subadults		Combined	
Year	Adults	Subadults	Unk	Prop.	95% *CI*.	Prop.	95% *CI*.	Prop.	95% *CI*
1990	20	2	7	0.90	0.68-0.99	0.50	0.01-0.99	0.83	0.64-0.94
1991	37	1	0	0.16	0.06-0.32	0.00	0.00-0.98	0.16	0.06-0.31
1992	66	6	4	0.71	0.59-0.82	0.50	0.12-0.88	0.68	0.57-0.79
1993	66	0	2	0.24	0.15-0.36	——	————	0.25	0.15-0.37
1994	84	5	2	0.68	0.57-0.78	0.40	0.05-0.85	0.65	0.54-0.75
1995	84	3	0	0.17	0.09-0.26	0.00	0.00-0.71	0.16	0.09-0.26
1996	84	8	3	0.82	0.72-0.90	0.63	0.24-0.91	0.80	0.71-0.88
1997	100	6	0	0.42	0.32-0.52	0.00	0.00-0.46	0.40	0.30-0.50
1998	96	8	3	0.61	0.51-0.71	0.25	0.03-0.65	0.60	0.50-0.69
1999	91	2	1	0.18	0.10-0.27	0.00	0.00-0.84	0.17	0.10-0.26
2000	85	2	0	0.54	0.43-0.65	0.50	0.01-0.99	0.54	0.43-0.65
2001	75	2	2	0.87	0.77-0.93	0.00	0.00-0.84	0.85	0.75-0.92
2002	64	8	4	0.55	0.42-0.67	0.00	0.00-0.37	0.49	0.37-0.60
2003	64	5	0	0.06	0.02-0.15	0.00	0.00-0.52	0.06	0.02-0.14
2004	66	2	2	0.79	0.67-0.88	0.50	0.01-0.99	0.79	0.67-0.87
2005	71	4	1	0.46	0.35-0.59	0.25	0.01-0.81	0.45	0.33-0.57
2006	47	2	1	0.06	0.01-0.18	0.00	0.00-0.84	0.06	0.01-0.17
2007	48	1	0	0.63	0.47-0.76	0.00	0.00-0.98	0.61	0.46-0.75
2008	53	1	4	0.74	0.60-0.85	0.00	0.00-0.98	0.72	0.59-0.83
2009	33	1	0	0.06	0.01-0.20	0.00	0.00-0.98	0.06	0.01-0.20
2010	35	2	0	0.89	0.73-0.97	0.00	0.00-0.84	0.84	0.68-0.94
2011	18	0	0	0.00	0.00-0.19	——	————	0.00	0.00-0.19
2012	27	0	1	0.44	0.25-0.65	——	————	0.43	0.24-0.63
2013	31	0	0	0.10	0.02-0.26	——	————	0.10	0.02-0.26
Overall:	1445	71	37	0.48	0.46-0.51	0.23	0.13-0.34	0.47	0.45-0.50

Appendix E. Proportion of female spotted owls that fledged young on the Oregon Coast Ranges Study Area, 1990-2013. Estimates were calculated for paired or single females for which the number of young fledged was determined before 31 August.

	n			Adults		Subadults		Combined	
Year	Adults	Subadults	Unk	Prop.	95% *CI*	Prop.	95% *CI*	Prop.	95% *CI*.
1990	34	4	14	0.71	0.53-0.85	0.50	0.07-0.93	0.62	0.47-0.75
1991	51	2	2	0.12	0.04-0.24	0.00	0.00-0.84	0.13	0.05-0.24
1992	78	7	4	0.54	0.42-0.65	0.14	0.00-0.58	0.48	0.38-0.59
1993	70	0	3	0.11	0.05-0.21	——	————	0.12	0.06-0.22
1994	95	6	3	0.48	0.38-0.59	0.00	0.00-0.46	0.45	0.35-0.55
1995	91	3	1	0.10	0.05-0.18	0.00	0.00-0.71	0.09	0.04-0.17
1996	93	10	6	0.67	0.56-0.76	0.40	0.12-0.74	0.63	0.54-0.72
1997	109	6	1	0.24	0.16-0.33	0.00	0.00-0.46	0.23	0.16-0.32
1998	100	9	3	0.41	0.31-0.51	0.11	0.00-0.48	0.38	0.29-0.47
1999	99	3	3	0.08	0.04-0.15	0.00	0.00-0.71	0.09	0.04-0.16
2000	97	4	0	0.33	0.24-0.43	0.25	0.01-0.81	0.33	0.24-0.43
2001	87	4	4	0.68	0.57-0.77	0.00	0.00-0.60	0.65	0.55-0.75
2002	75	9	4	0.27	0.17-0.38	0.00	0.00-0.34	0.24	0.15-0.34
2003	80	8	1	0.05	0.01-0.12	0.00	0.00-0.37	0.04	0.01-0.11
2004	86	2	5	0.51	0.40-0.62	0.00	0.00-0.84	0.49	0.39-0.60
2005	74	4	2	0.32	0.22-0.44	0.00	0.00-0.60	0.30	0.20-0.41
2006	63	3	1	0.03	0.00-0.11	0.00	0.00-0.71	0.03	0.00-0.10
2007	63	2	0	0.38	0.26-0.51	0.00	0.00-0.84	0.37	0.25-0.50
2008	56	2	4	0.46	0.33-0.60	0.00	0.00-0.84	0.42	0.30-0.55
2009	46	2	0	0.02	0.00-0.12	0.00	0.00-0.84	0.02	0.00-0.11
2010	45	2	2	0.31	0.18-0.47	0.00	0.00-0.84	0.31	0.18-0.45
2011	21	0	0	0.00	0.00-0.16	——	————	0.00	0.00-0.16
2012	29	0	1	0.21	0.08-0.40	——	————	0.20	0.08-0.39
2013	38	0	1	0.03	0.00-0.14	——	————	0.03	0.00-0.13
Overall:	1680	92	65	0.31	0.29-0.34	0.10	0.05-0.18	0.30	0.28-0.33

Appendix F. Proportion of nesting female spotted owls that fledged young on the Oregon Coast Ranges Study Area, 1990-2013. Estimates were calculated for paired or single females whose nesting status was determined by 1 June.

	n			Adults		Subadults		Combined	
Year	Adults	Subadults	Unk	Prop.	95% *CI*	Prop.	95% *CI*	Prop.	95% *CI*
1990	17	1	5	0.82	0.57-0.96	1.00	0.03-1.00	0.74	0.52-0.90
1991	6	0	0	0.67	0.22-0.96	——	————	0.67	0.22-0.96
1992	46	3	2	0.85	0.71-0.94	0.33	0.01-0.91	0.78	0.65-0.89
1993	15	0	1	0.53	0.27-0.79	——	————	0.50	0.25-0.75
1994	57	2	0	0.75	0.62-0.86	0.00	0.00-0.84	0.73	0.60-0.84
1995	14	0	0	0.64	0.35-0.87	——	————	0.64	0.35-0.87
1996	69	5	2	0.80	0.68-0.88	0.60	0.15-0.95	0.78	0.67-0.86
1997	42	0	0	0.62	0.46-0.76	——	————	0.62	0.46-0.76
1998	59	2	3	0.69	0.56-0.81	0.50	0.01-0.99	0.66	0.53-0.77
1999	16	0	0	0.50	0.25-0.75	——	————	0.50	0.25-0.75
2000	46	1	0	0.65	0.50-0.79	1.00	0.03-1.00	0.66	0.51–0.79
2001	65	0	2	0.83	0.72-0.91	——	————	0.82	0.71-0.90
2002	35	0	2	0.54	0.37-0.71	——	————	0.54	0.37–0.71
2003	4	0	0	1.00	0.40-1.00	——	————	1.00	0.40-1.00
2004	52	1	2	0.79	0.65-0.89	0.00	0.00-0.98	0.75	0.61-0.85
2005	30	1	0	0.77	0.58-0.90	0.00	0.00-0.98	0.74	0.55-0.88
2006	3	0	0	0.67	0.09-0.99	——	————	0.67	0.09-0.99
2007	29	0	0	0.76	0.56-0.90	——	————	0.76	0.56-0.90
2008	38	0	2	0.63	0.46-0.78	——	————	0.60	0.43-0.75
2009	2	0	0	0.50	0.01-0.99	——	————	0.50	0.01-0.99
2010	29	0	0	0.41	0.24-0.61	——	————	0.41	0.24-0.61
2011	0	0	0	——	————	——	————	——	————
2012	12	0	0	0.50	0.21-0.79	——	————	0.50	0.21-0.79
2013	3	0	0	0.33	0.01-0.91	——	————	0.33	0.01-0.91
Overall:	689	16	21	0.71	0.67-0.74	0.44	0.20-0.70	0.69	0.65-0.72

Appendix G. Estimated mean fecundity ($\hat{b}$) of female spotted owls on the Oregon Coast Ranges Study Area, 1990-2013. Fecundity was defined as the number of female young produced per female, assuming a 1:1 sex ratio of offspring. Estimates were calculated for any female for which the number of young fledged was determined before 31 August.

	n			Adults		Subadults		Combined	
Year	Adults	Subadults	Unk	$\hat{b}_A$	*SE*	$\hat{b}_S$	*SE*	$\hat{b}$	*SE*
1990	34	4	14	0.47	0.06	0.25	0.14	0.40	0.05
1991	51	2	2	0.09	0.04	0.25	0.25	0.10	0.04
1992	78	7	4	0.42	0.05	0.14	0.14	0.38	0.05
1993	70	0	3	0.09	0.03	——	——	0.10	0.03
1994	95	6	3	0.37	0.04	0.00	0.00	0.34	0.04
1995	91	3	1	0.08	0.03	0.00	0.00	0.08	0.03
1996	93	10	6	0.52	0.04	0.35	0.15	0.50	0.04
1997	109	6	1	0.17	0.03	0.00	0.00	0.16	0.03
1998	100	9	3	0.32	0.04	0.11	0.11	0.29	0.04
1999	99	3	3	0.06	0.02	0.00	0.00	0.06	0.02
2000	97	4	0	0.26	0.04	0.13	0.13	0.25	0.04
2001	87	4	4	0.59	0.05	0.00	0.00	0.57	0.05
2002	75	9	4	0.19	0.04	0.00	0.00	0.17	0.04
2003	80	8	1	0.03	0.02	0.00	0.00	0.03	0.01
2004	86	2	5	0.40	0.05	0.00	0.00	0.39	0.04
2005	74	4	2	0.24	0.04	0.00	0.00	0.22	0.04
2006	63	3	1	0.03	0.02	0.00	0.00	0.03	0.02
2007	63	2	0	0.29	0.05	0.00	0.00	0.28	0.05
2008	56	2	4	0.38	0.06	0.00	0.00	0.34	0.06
2009	46	2	0	0.01	0.01	0.00	0.00	0.01	0.01
2010	45	2	2	0.22	0.05	0.00	0.00	0.21	0.05
2011	20	0	0	0.00	0.00	——	——	0.00	0.00
2012	29	0	1	0.14	0.05	——	——	0.13	0.05
2013	38	0	1	0.01	0.01	——	——	0.01	0.01
Overall:	1679	92	65	0.24	0.01	0.08	0.03	0.23	0.01

Appendix H. Mean brood size of female spotted owls on the Oregon Coast Ranges Study Area, 1990-2013. Mean brood size was defined as the number of young produced per female that fledged at least one young before 31 August.

	n			Adults		Subadults		Combined	
Year	Adults	Subadults	Unk	$\bar{x}$	*SE*	$\bar{x}$	*SE*	$\bar{x}$	*SE*
1990	24	2	6	1.33	0.10	1.00	0.00	1.31	0.08
1991	6	0	1	1.50	0.22	——	——	1.43	0.20
1992	42	1	0	1.57	0.08	2.00	——	1.58	0.08
1993	8	0	1	1.50	0.19	——	——	1.56	0.18
1994	46	0	1	1.52	0.07	——	——	1.51	0.07
1995	9	0	0	1.67	0.17	——	——	1.67	0.17
1996	62	4	3	1.56	0.06	1.75	0.25	1.58	0.06
1997	26	0	1	1.38	0.10	——	——	1.37	0.09
1998	41	1	0	1.56	0.09	2.00	——	1.57	0.08
1999	8	0	1	1.50	0.19	——	——	1.44	0.18
2000	32	1	0	1.56	0.09	1.00	——	1.55	0.09
2001	59	0	3	1.75	0.06	——	——	1.76	0.06
2002	20	0	1	1.45	0.11	——	——	1.43	0.11
2003	4	0	0	1.25	0.25	——	——	1.25	0.25
2004	44	0	2	1.57	0.08	——	——	1.57	0.07
2005	24	0	0	1.46	0.10	——	——	1.46	0.10
2006	2	0	0	2.00	0.00	——	——	2.00	0.00
2007	24	0	0	1.50	0.10	——	——	1.50	0.10
2008	26	0	0	1.62	0.11	——	——	1.62	0.11
2009	1	0	0	1.00	——	——	——	1.00	——
2010	14	0	1	1.43	0.14	——	——	1.40	0.13
2011	0	0	0	——	——	——	——	——	——
2012	6	0	0	1.33	0.21	——	——	1.33	0.21
2013	1	0	0	1.00	——	——	——	1.00	——
Overall:	529	9	21	1.54	0.02	1.56	0.18	1.54	0.02